NASA/DoD Aerospace Knowledge Diffusion Research Project

Paper Thirty Three

Technical Communications Practices and the Use of Information Technologies as Reported by Dutch and U.S. Aerospace Engineers

Paper Presented at the
International Professional Communication Conference (IPCC)
Philadelphia, Pennsylvania
October 5-8, 1993

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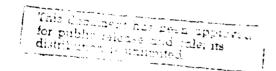Thomas E. Pinelli
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As part of Phase 4 of the NASA/DoD Aerospace Knowledge Diffusion Research Project, two studies were conducted that investigated the technical communications practices of Dutch and U.S. aerospace engineers and scientists. A self-administered questionnaire was distributed to aerospace engineers and scientists at the National Aerospace Laboratory (The Netherlands), and NASA Ames Research Center (U.S.), and the NASA Langley Research Center (U.S.). This paper presents responses of the Dutch and U.S. participants to selected questions about four of the seven project objectives: determining the importance of technical communications to aerospace engineering professionals, investigating the production of technical communications, examining the use and importance of computer and information technology, and exploring the use of electronic networks.

Introduction

Rapidly changing patterns of international cooperation and collaboration and revolutionary technological and managerial changes are combining to influence and transform the communication of technical information in the workplace. To better understand workplace culture, organization, and communication at the national and international levels, an exploratory study investigated the technical communications practices of aerospace engineers and scientists at three similar research organizations in the Netherlands and the United States (U.S.). Previous work includes exploratory

technical communications, the use of computer and information technology, and electronic network use.

Demographic information about the survey respondents

Survey respondents were asked to provide information about their professional duties, years of work experience, educational preparation, current professional duties, and gender. A comparison shows that respondents are similar in terms of their professional duties, years of professional work experience, level of education and educational preparation, current duties, and gender. They differ in organizational affiliation and membership in a professional/technical society.

The following "composite" participant profiles were based on these data. The Dutch survey respondent works as a researcher (63%), has a graduate degree (80%), was trained as an engineer (74%) and currently works as an engineer (75%), and has an average of 12 years professional work experience. The U.S. survey respondent works as a researcher (80%), has a graduate degree (73%), was trained as an engineer (80%) and currently works as an engineer (69%), has an average of 17 years professional work experience, and belongs to a professional/technical society (78%).

Importance of and time spent on technical communication

Approximately 91% of the Dutch and U.S. respondents indicated that the ability to communicate technical information effectively is important. (Importance was measured on a 5-point scale, with 1 = very unimportant and 5 = very important; percentages = combined "4" and "5" responses.) Technical communication takes up 68% of the Dutch respondent's and 77% of the U.S. respondent's 40-hour work week. Dutch respondents spent an average of 15.6 hours per week communicating technical information to others and an average of 11.65 hours per week working with communications received from others. U.S. respondents spent an average of 16.98 hours per week communicating technical information to others and an average of 13.97 hours per week working with communications received from others.

Approximately 45% of the Dutch respondents indicated that, as they have advanced professionally, they have increased the amount of time they spend communicating technical information. Likewise, 65% of the U.S. respondents indicated that, as they have advanced professionally, they have increased the amount of time they spend communicating technical information.

The production of technical communications

Collaborative writing was examined as part of the study. Seventy-six percent of the Dutch respondents and 85% of the U.S. respondents write in groups of 2–8 people. Only 28% of the Dutch respondents and 33% of the U.S. respondents indicated that group writing is more productive than writing alone, however. Of those survey respondents who do not write alone, 49% of the Dutch group and 47% of the U.S. group work with the same persons when producing written technical communications

Both groups were asked to indicate the average number of communications they had prepared, alone or in groups, and used in the last six months. Individually the Dutch most frequently prepared letters (15), memos (4), drawings/specifications (4), A/V materials (3), and technical talks/presentations (3). Working in groups, the Dutch most frequently prepared letters (13), trade/promotional literature (4), drawings/specifications (3), in-house technical reports (2), and conference/meeting papers (2).

Individually the U.S. respondents most frequently prepared memos (16), letters (10), drawings/specifications (7), A/V materials (6), and technical talks/presentations (4). Working in groups, the U.S. respondents most frequently prepared letters (6), A/V

Table 1. Potential Use of Information in Electronic Formats

Type of Information	Netherlands		U.S.	
	%	(n)	%	(n)
Data tables/mathematical presentations	44	(48)	57	(194)
Computer program listings	51	(56)	56	(189)
Online system (full text and graphics) for technical papers	61	(66)	70	(237)
CD-ROM system (full text and graphics) for technical papers	52	(57)	58	(196)

Discussion

Given the limited purposes of this exploratory study. the overall response rates, and the research designs, no claims are made regarding the extent to which the attributes of the respondents in the studies accurately reflect the attributes of the populations being studied. A more rigorous research design and methodology would be needed before any claims could be made. Nevertheless, the findings do permit the formulation of general statements regarding the technical communications practices of the aerospace engineers and scientists who participated in the studies.

- The ability to communicate technical information effectively is equally important to Dutch and U.S. aerospace engineers and scientists.

- As these Dutch and U.S. respondents have advanced professionally, the amount of time they spend producing and working with technical communications has increased for nearly one-half (45%) of the Dutch group and nearly two-thirds (65%) of the U.S. group.

- Both groups frequently produce the same types of materials whether they write as individual authors or as members of a group.

- Both groups of respondents show notable similarities in terms of the computer and information technologies they presently use and those they anticipate using in the future.

Despite the limitations of these studies, the findings contribute to our knowledge of technical communications practics among aerospace engineers and scientists at the national and international levels. The findings reinforce some of the conventional wisdom regarding the importance of effective communication and the types of communications produced in the workplace. They also provide insight into current uses of computer and information technology and electronic networks and the expectations of users for increased communications capabilities in a high-technology environment.

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